

TEMPERATURE OF THE AIR.

In General.—The general distribution of the temperature of the air is shown by the isotherms on Chart No. II. The table of comparative temperatures, in the left-hand corner of same chart shows the temperature of the month to have been unusually high over the northern section of the country, especially in Minnesota, the Lake region, Middle States and New England; about normal in the Lower Missouri valley and below normal in the Gulf States and Texas.

Monthly mean temperatures at special points have been as follows: Mt. Washington, 21° and Pike's Peak, 6°.

Maximum and minimum temperatures.—Maximum temperatures, at Signal Service stations, above 80° are reported as follows: 89° at Key West; 86° at Los Angeles and Fort Griffin; 85° at Laredo; 84° at Jacksonville; 83° at Wilmington; 82° at Indianola and Stockton; 81° at Savannah, St. Marks, Eagle Pass, and 80° at Charleston, Tybee Island and Brackettville. Other stations than those of the Signal Service, have reported as follows: 82° Ft. Barrancas, Fla., Baton Rouge Bks, La.; 85° St. Augustine, Fla.; 87° Houston, Fla.

Minimum temperatures, at Signal Service station, below zero: —23° at Pike's Peak; —18° at Denver; —12° at Cheyenne; —10° at North Platte; —6° at Bismarck; —5° at Yankton; —4° at Breckenridge; Pembina; —2° at Omaha; —1° at Mt. Washington.

At stations other than those of the Signal Service, —2° Ft. Larned and Great Bend, Kan., Guttenburg and Tabor, Iowa; —3°, Ft. Lyon and Golden, Col., Norfolk and Plattsburg, Neb.; —4°, Ft. Pembina, Dak., Boonsboro, Iowa; —5°, Ft. Hartsoff, Neb.; —6°, S. Pueblo, Col., Neillsonville, Miss.; —7°, Ft. McPherson, Neb., Vail, Iowa; —8°, Ft. Rice; —9°, Ft. Lincoln, Dak., Colorado Springs, Nora Springs, Iowa; —10°, Ft. Hayes, Kan.; Byron and Cresco, Iowa; —12°, Ft. Union, N. M.; Camp Sheridan, Neb.; —14°, Camp Brown, N. Y.; Ft. Randall, Dak.; —16°, Sydney Barracks, Neb.; —18°, Ft. Steele, N. Y.; —22°, Ft. Sanders, N. Y., and at Ft. Garland, Col.

Ranges of Temperature.—Large monthly and diurnal ranges have been respectively as follows: Denver, monthly, 85°, diurnal, 38°; North Platte, 78° and 42°; Dodge City, 71° and 40°; Ft. Griffin, 71° and 39°; Stockton, 68°, 44°; Mason, 63° and 38°; Yankton, 62° and 30°; Bismarck, 62° and 37°; Pembina and Breckenridge, 58° and 38°; Winnemucca, 50° and 45°; Knoxville, 51° and 39°.

The smallest ranges have been, San Francisco, 20° and 14°; Key West, 35° and 12°; San Diego, 31° and 23°; Sacramento, 33 and 27°; Red Bluff, 34° and 23°; Thatchers Island, 31° and 22°, Eastport, 27° and 26°; Alpena, 36° and 19°, and Escanaba, 31° and 21°. Small daily ranges have also occurred at Galveston, 19°, and New Orleans, Tybee, Sandy Hook and New York, 21°.

Frosts were reported on nearly every day during the month in the following sections, Rocky Mountain region, Northwest, Lake region and Ohio valley, Middle States and New England. In the following States frosts were reported as follows: 1st, Tex., S. C.; 3d, N. C., Tenn.; 3th, Ala., Ga., S. C., N. C., Tenn.; 5th, Tex., N. C.; 6th, Ga., N. C., Tenn.; 7th, La., Miss., Ga., N. C., Tenn., Tex.; 9th, Tex.; 10th, Tex., La., Ga., N. C., Tenn.; 11th, Tex., La., Ala., Miss., Ga., Fla., S. C., N. C., Tenn.; 12th, Tex., La., Ala., Miss., Ga., Fla., S. C., N. C., Tenn.; 13th, Ala., Miss., Ga., Fla., S. C., N. C., Tenn.; 14th, N. C.; 19th, N. C., Tenn.; 22nd, Tex., La.; 23d, La.; 24th, Miss., Fla.; 25th, Tex., Miss., Ga., Fla.; 26th, Tex., La., Miss., Ga.; 27th, Tex., Miss., Tenn.; 28th, Tex., Miss., Ga., N. C.; 19th, Tex., La., Miss., Ga., N. C., Tenn.; 30th, Tex., La., Ala., Miss., Ga., Fla., N. C., Tenn.

Ice.—Under the had of navigation will be found the freezing over of rivers. In Dakota and Minnesota the surface of water has continued frozen throughout most of the month; elsewhere ice has occurred as follows: 1st., La. Mich., Ohio, Va., N. J. 2nd, Kan. 3d, Kan., Mo., Ill., Ind., Ohio, $\frac{1}{2}$ inch. 4th, Kan. Mich., W. Va., Md., Pa., N. J., N. Y., Mass. 5th, Neb., Kan., N. Y. 6th, Kan., 1 inch; I. T., Tex., $\frac{1}{2}$ in; Mo., Ill., Mich., Ind., Ohio, Ky., Tenn., Va., Md., $\frac{1}{2}$ in; Pa., $\frac{1}{2}$ in; N. Y. 7th, Ky., Tenn., S. C.; N. C., 1-10 in.; Va., $\frac{1}{2}$ in; N. J., N. Y., $\frac{1}{2}$ in; Conn., R. I. 8th, N. Y., Conn. 9th, Kan., Ohio. 10th, I. T., Teq., Ill., Ind., Ohio. 11th, Kan., Tex., La., Ind., Ohio, Tenn., Miss., Ga., N. C. 12th, Tex., Ohio, N. C., Pa., N. J., N. Y., $\frac{1}{2}$ in; Conn. 13th, Ill., Mich., Ga., N. C. 14th, Me. 19th, Pa., Conn. 20th, Pa., Conn., N. H. 21st, S. C., N. H. 23d, Tex. 27th, Kan., Tex. 28th, Tex., Iowa, Ill. 29th, Neb., Kan., Tex., $\frac{1}{2}$ in; Iowa, La., 2 ins.; Wis., Miss., Ala. 30th, Neb. Kan., 1 $\frac{1}{2}$ ins.; Tex., $\frac{1}{2}$ in; Iowa, Wis., Ind., 2 $\frac{1}{2}$ ins.; Ohio, Ala., $\frac{1}{2}$ in; Ga., Fla., 3-16 in.; N. C., Va., Conn.

PRECIPITATION.

In general.—The general distribution of rain for the month, is shown on chart No. III. The table in the lower left hand corner gives the average precipitation in the various districts, and shows a large excess over the November mean in the Gulf and Atlantic States, Lake region and St. Lawrence valley and a deficiency in the extreme Northwest, where most of the precipitation has occurred as snow. In Oregon there has also been a large excess. Most of the precipitation fell as heavy rains, as will be seen by the following list, and during the passage of the storms Nos. I, V and VIII.

Special heavy rains.—The following notable cases of heavy rains have been reported: 1st, Belmont Farm, Tex., 7.00 in.; Point Pleasant, La., 3.95 in. 8th, Point Pleasant, La., 6.80 in.; Carlisle, Pa., 3.00 in.; Charleston, S. C., 4.17 in. 9th, Mystic, Conn., 3.20 in.; Fall River, Mass., 3.00 in.; Garrison, N. Y., (8th, 9th,) 3.64 in.; Mt. Washington, N. H., (8th, 9th,) 4.74 in.; Colebrook, Conn., (8th, 9th,) 3.60 in. 11th and 12th, San Luis Rey valley, 2.50 to 3.50 in.; Temecula, 3.00 in.; on the Cajon, 3.00 in. 17th, Belmont Farm, Tex., (16th, 17th,) 4.00 in. 20th, New Orleans, La., (19th, 20th,) 3.06 in.; Fort Barrancas, Fla., 4.30 in. in 7½ hours; Point Pleasant, La., 7.10 in.; Fort Sill, Indian Ter., (19th, 20th,) 3.85 in. 21st, Augusta, Ga., 3.07 in. 23rd, Spartauburg, S. C., (21st, 23rd,) 3.00 in.; Statesville, N. C., 23rd,) 4.50 in.; Wytheville, W. Va., (22nd, 23rd,) 4.30 in.; Smithville, N. C., (22nd, 23rd,) 4.10 in.; 24th, Mt. Solon, Va., 4.65 in.; Sandy Springs, Md., (23rd, 24th,) 5.00 in.; Boonsboro', Va., 4.50 in.; Dover, Del., (23rd, 24th,) 3.30 in.; Owing's Mills, Md., (23rd, 24th,) 3.81 in.; Carlisle, Pa., 3.20 in.; Snowville, Va., (21st, 24th,) 3.50 in.; Atlantic City, N. J., 3.09 in.; Lynchburg, Va., (22nd to 24th,) 6.07 in. 25th, New Market, Md., Emmittsburg, Md., 3.78 in.; (22nd, 25th,) 5.62 in.; Fallston, Md., (24th, 25th,) 4.50 in.; Barnegat, N. J., (24th, 25th,) 5.33 in.; Milford, Del., (23rd, 25th,) 3.50 in. 26th, Mechanics' Falls, Me., 3.47 in.; Woodstock, Md., 3.51 in.; Lawrence, Mass., (26th, 27th,) 3.47 in.; Somerset, Mass., (25th, 26th,) 2.99 in.; Green Castle, Pa., (22nd, 26th,) 3.92 in.; Fort Preble, Me., (25th, 26th,) 3.25 in.; New Bedford, Mass., 2.98 in.; Boston, Mass., (25th, 26th,) 3.95 in.; Portland, Me., (25th, 26th,) 4.16 in.; Wood's Holl, Mass., (25th, 26th,) 3.55 in.; Fall River, Mass., (25th, 26th,) 2.98 in.; Auburn, N. H., (25th, 26th,) 4.00 in. 27th, West Waterville, Me., 3.00 in.; Waltham, Mass., (25th, 27th,) 4.46 in.; Orono, Me., (26th, 27th,) 2.60 in.; Cornish, Me., 4.08 in.; Gardiner, Me., (26th, 27th,) 3.80 in.; Mt. Washington, N. H., (26th, 27th,) 4.80 in.; Standish, Me., (25th, 27th,) 4.41 in.; Milton, Mass., (26th, 27th,) 3.00 in.

Large Monthly Rainfalls.—The following stations report large monthly rainfalls: Pt. Pleasant, La., 20.89 in.; Mt. Washington, 17.56 in.; Cape Lookout, N. C., 12.23 in.; Portland, Or., 12.45; New Market and Fallston, Md., over 10.00 in.; Boston and Lynchburg, 9.65 in.; Woodstock, Md., 9.83 in.; Emmittsburg, Md., 9.94 in.; Sandy Springs, Md., 9.75 in.

Small Monthly Rainfalls.—The following stations report little or no rain: Pioche, Nev., none; Sidney Barracks, Neb., none; San Diego, Cal., .06 in.; Ft. Wallace, Kan., .06 in.; Ft. Sanders, N. Y., .09 in.; Camp Brown, N. Y., .18 in.; Ft. Lyon, Col., .14 in.; Ft. Larned, Kan., .20 in.; Rio Grande, Tex., .13 in.; Eagle Pass, Tex., .25 in.; Breckenridge, Min., .29 in.; North Platte, Neb., .30 in.; Bismarck, Dak., .40 in.

Floods.—Special heavy floods followed the rains of the 24th and 25th, accompanying storm No. VIII on chart No. I, during its northward course from South Carolina to West Virginia. The following items will serve to give some idea of the severity of these floods. The Savannah river reached its maximum height, 23 ft. 10 in., at Augusta, about 7 p. m. of the 23d, when the lower portion of the city was flooded; Chervis and Horn's creeks were higher than ever before recorded. Fishing creek, York co., S. C., "highest water ever known"—train wrecked. The Roanoke river, at Weldon, N. C., rose six feet nine inches higher than highest water-mark known, sweeping away two railroad bridges. The Dan river, at Danville, Va., "within one foot of highest water-mark ever known;" Little and Big Sandy rivers "higher than ever known." In Pittsylvania and Henry counties, Va., and Caswell and Rockingham counties, N. C., the streams all overflowed, doing immense damage; in Fall creek "every bridge swept away." The James river, at Buchanan, rose six feet higher than during the freshet of 1842; the railroad lumber house, which was several feet above the high water of 1842, was swept away; immense damage was done to the James river and Kanawha canal. At Lynchburg the water reached within three feet of the great freshet of 1870, the maximum of flood being 33 feet; the Amherst and two other bridges were swept away. At Richmond, at 10 p. m. of the 25th, the river rose 24 ft. 7 in. above ordinary high tide, or 2 ft. 1 in. above high water-mark of 1870; the river, which is here usually about 200 yards wide, was now from two to three miles wide, flooding the whole river front of the city to the house tops. The city of Manchester, opposite Richmond, was nearly half under water. The Rivanna, North Anna and Jacksons rivers, "all as high as 1870," the Rivanna causing great damage at Charlottesville. The Rappahannock, at Fredericksburg, rose 22 feet above ordinary water. The North Branch of the Potomac, at Piedmont, was stated to be higher than since 1810; along the course of the South Branch immense damage was done. At the junction of the Potomac and Sheuandoah, on the 25 at 3 p. m., both rivers were twenty-six feet above low water-mark, or three feet higher than in 1870. Considerable damage was done in all these valleys. Conococheague, rising in South mountain, Franklin co., Pa., rose four feet higher than highest water-mark known, or 15 feet above ordinary level at Chambersburg, at midnight of the 24th, doing considerable damage. In Washington, Baltimore and Philadelphia the wharves and streets along the river banks were submerged. In Georgetown, D. C., at 7 p. m., of the 24th, the Potomac was three feet and nine inches below level of wharf at foot of Washington street, and at 1 a. m., of the 26th, when the highest point was reached, it was six feet and half an inch above the wharf. In Maine severe freshets also occurred on the 26th in the Passumpsic, Androscoggin and Kennebec rivers.

Hail occurred on the 1st, Ill.; 2nd, Ohio; 3rd, N. Y., Iowa; 4th, 5th, 6th, Idaho, Ter.; 7th, 8th, 9th, 10th, Conn.; 11th, 12th, 13th, Kan.; 14th, 15th, Ala.; 16th, Ill.; Mass.; Tex.; 17th, Mass.; Pa.; 18th, 19th, 20th, 21st, 22nd, 23rd, Kan.; Idaho, Ter.; 24th, Kan.; 25th, 26th, Tenn.; 27th, Mass.; Ind.; 28th, Pa.; 29th, 30th, Neb.

Snow.—During the month, snow fell as follows: from the 1st to the 10th, 16 to 19th, and 27th to 30th, snow fell over the entire country from Wyoming and Colorado eastward over the Northwest and Lake region to New England. From the 5th to the 11th, occasional snow fell in Nevada, Utah, New Mexico, Tex., Indian Ter., Mo., N. C., Md., and N. J. From the 13th to the 18th in Nevada, New Mexico. From the 21st to 27th in Idaho, Nevada and New Mexico, and from 29th to 30th in Indian Ter., Tenn., Ky., W. Va., N. C., Va., Md., N. J. At the end of the month the depth of snow was reported as follows: Summit of Mt. Washington, 18 in.; Pike's Peak, 12 in.; in Wisconsin from 1 to 13 in.; in N. Y. and N. J., from $\frac{1}{2}$ to 8 in.; in Mich. and Pa., $\frac{1}{2}$ to 5 in.; in Neb., Dak., Min., Iowa and Ill., 1-10 to 4 in.; in Wyo., Col., Kan., Ind., Ver., and Me., 1-10 to 2 in.; in Ohio, 1-20 to $\frac{1}{2}$ in.; West Va., 1-10; Va., $\frac{1}{2}$ in.

Rainy days.—The number of days on which rain has fallen, as recorded by the Signal Service observers, ranges as follows: New England, 11 to 17; Middle Atlantic States, 11 to 14; South Atlantic States, 9 to 14; East Gulf States, 12 to 16; West Gulf States, 7 to 10; Tennessee and Ohio valley, 12 to 18; Missouri valley, 11 to 17; Upper Mississippi valley, 13 to 19; Upper Lake region, 11 to 20; Lower Lake region, 16 to 22; Rocky Mountain stations, 3 to 9; California, 0 to 8; Oregon, 13 to 23.

Cloudy days.—The number of cloudy days reported during the month by voluntary observers and army surgeons ranges about as follows: New England, 5 to 21; Middle Atlantic States, 5 to 22; South Atlantic States, 3 to 11; East Gulf States, 7 to 16; West Gulf States, 2 to 18; Tennessee and Ohio valley, 2 to 19; Lower Missouri valley, 2 to 17; Upper Mississippi valley, 2 to 19; Upper Lake region, 7 to 18; Lower Lake region, 5 to 19; Rocky Mountain stations, 4 to 12; California, 1 to 17.

RELATIVE HUMIDITY.

The average relative humidity for the month ranges about as follows: For New England, 67 to 77; Middle Atlantic States, 59 to 77; South Atlantic States, 71 to 77; East Gulf States, 68 to 76; West Gulf States, 65 to 72; Tennessee and the Ohio valley, 64 to 73; Lower Lakes, 66 to 78; Upper Lakes, 70 to 82; Upper Mississippi valley, 67 to 80; Lower Missouri valley, 67 to 74; California coast, 55 to 75; Sacramento valley, 70 to 74. High stations report the following average percentages, not corrected for altitude: Cheyenne, 65; Denver, 49; Mt. Washington, 88; Pike's Peak, 63; Salt Lake City, 55; Santa Fe, 49; Winnemucca, 64.

WINDS.

In General.—The prevailing winds at Signal Service stations are shown by the arrows on chart No. II, from which it will be seen that northwesterly or northerly winds have generally prevailed over the entire country, except in the Lake region, where they have been westerly or southerly, along the South Atlantic and East Gulf States, where they have been more northeasterly, and in Oregon and Idaho, where they have been southerly.

Total Movements.—The largest total movements have been as follows: Pikes Peak, 18,131 miles; Cape May, 14,360; Sandy Hook, 13,619; Cape Lookout, 13,298; Kittyhawk, 12,239; Barnegat, 11,958; Cape Hatteras, 11,099; Cape Henry, 11,026; Dodge City, 11,060; Indianola, 11,081; Thatcher's Island, 11,670; Breckenridge, 10,713; North Platte, 10,365; Sandusky, 10,130. On Mount Washington the total movement is not recorded, but hurricane winds prevailed continuously from the 2d to the 9th, from the 12th to the 19th, and again on the 26th and 27th, velocities of 120 miles per hour being frequently recorded.

The least movements have been as follows: La Mesilla, N.W., 1,146 miles; Roseburg, Or., 2,006; Visalia, Cal., 1,301; Boise City, Idaho, 2,793; Lynchburg, 2,633, and Augusta, 3,233.

The highest velocities, in miles per hour, have been as follows: Mt. Washington, N.W., 132 miles on the 12th; Pikes Peak, N., 80, 29th; Wood's Holl, S., 64, and New London, S.W., 63, on the 2d; Bismarck, N., 60, 26th; Buffalo, W., 60, 2nd; Cape Lookout, S.E., 60, on the 8th and 24th; Escanaba, N., 60, 8th; North Platte, N.W., 62, 8th; Philadelphia, E., 60, 24th.

Local Storms, Tornadoes etc., as distinct from extended storm-areas, have occurred as follows: November 2nd, at Mattewan, on the Hudson, buildings were blown down; at Winslow, Seaside, Heightstown and Cony Island, N. J., and Brooklyn, N. Y., considerable damage was done to buildings; a southeast tornado was reported at Long Branch; almost a hurricane at Newport; Fall River, Mass., violent cyclone; Trenton, N. J., at 2 p. m., a "terrific squall occurred, which swept before it trees, fences, telegraph wires, &c., and did considerable damage to buildings; several houses were blown down, and others unroofed"; Hamilton Square, N. J., shortly after 3 o'clock in the afternoon, the wind, which had been severe all day, terminated in a hurricane. It struck the village in the southwest and passed to the northeast, scattering destruction in its path. It seemed to be only a few hundred yards in width, and lasted only a few minutes.